DOCUMENT RESUME

ED 322 760 FL 018 771

AUTHOR Lutjeharms, Madeline
TITLE Lexical Access and Foreign Language Acquisition.
PUB DATE Apr 90
NOTE 15p.; Paper presented at the Meeting of the World Congress of Applied Linguistics (9th, Thessaloniki, Greece, April 15-21, 1990).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Information Analyses (070) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cognitive Processes; Dutch; *Error Correction; *German; Interference (Language); *Language Processing; *Learning Strategies; Second Language Learning; Uncommonly Taught Languages; *Vocabulary Development

ABSTRACT

A review of the literature and teacher observations are used to examine the processes and strategies by which second language learners attain and organize verbal knowledge. Classroom data are derived from experience in teaching German to Dutch-speaking university students. The analysis looks at the relationship of morphology and word recognition and retention, lack of attention given by second-language readers to word endings, and interference arising from lack of word contrast. Research on lexical access is examined for insights on such issues as the distinctions and relationships between mental lexicon, semantic memory, and common semantic or conceptual stores across languages. A distinction between semantic memory and mental lexicon is seen as necessary in explaining interference from lack of word contrast, and this approach is further developed in the context of other research. Further research is recommended. A 28-item bibliography is included. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
M. Lutjeharms
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Presented at the Meeting of
World Congress of Applied
Linguistics, 1990
(Thessaloniki, Greece)

ED322760

LEXICAL ACCESS AND FOREIGN LANGUAGE ACQUISITION

Madeline Lutjeharms (Vrije Universiteit Brussel)

A lot of research is carried out on the functioning of verbal knowledge and its organisation in memory. The results of this research tend to be very hypothetical. Data from experiments in cognitive psychology are gathered in the context of a hypothesis, that is later used for the interpretation of these findings. To what extent the data originate either from the setup of the experiment or reveal aspects of natural language processing is not always very clear. This renders the validity of the findings somewhat doubtful, even if they are statistically very reliable. Such experiments are necessary as no direct observation of language processing is possible. Because of the problems with validity, however, it is essential to gather data from as many different sources as possible. Impaired processes of language decoding or production in a natural context constitute one of the other possible data sources. Impaired language processing of this kind can frequently be observed in the use of a foreign language. Data from foreign language teaching could therefore be useful. Their "naturalness" probably lies somewhere inbetween the naturalness of the data from laboratory experiments and that from the data from selfinitiated foreign language use. However they generally have the advantage of their frequency and the large number of subjects.

My own data have been gathered when observing and testing my Dutch-speaking students learning German. The data are mainly concerned with receptive skills. Dutch and German are closely related languages. Therefore even a Dutchspeaker who never learned any German will to a certain degree understand elements of it. The word order is similar in both languages, but the

FL018711

BEST COPY AVAILABLE

German inflectional system, which makes the language more synthetical, presents some difficulties. Dutch often uses prepositions, where German uses inflectional indicators, in particular in the case of a dative object. The meaning of a large number of words can be guessed with the help of the L1, esp. with the help of some insight into sound shifts. But of course there are quite a number of deceptive cognates. My data originate from observation of my students during the teaching and learning process, where I use retrospection as a systematic teaching device, i.e. I ask my students why they made a certain error or found a solution, when many others did not. Another source of data are questions and spontaneous remarks from the students and their answers to my questions. In addition to this I have many data from reading comprehension tests, which consist of some global comprehension questions to be answered in the L1 and a number of questions on typical difficulties for Dutchspeakers when reading German, which mainly consist of translations of parts of sentences. Fairly free translations are accepted. The texts that are used are scientific texts concerned with human sciences. Consequently they are likely to be difficult to read on several levels. I had my data before I knew anything about cognitive psychology, which I only discovered when looking for an explanation of certain phenomena I had observed. This means the collection of my data has not been influenced by theories about memory and language processing.

The finding that morphemes seem to play a role in word recognition has been reported before in the literature (Hudson 1981, Smith/ Sterling 1982, Taft 1988). This finding could perhaps explain why in monosyllabic words global word shape apparently is an important factor. Words like "Tat" (deed, Dutch: daad) or "stets" (always, Dutch: steeds) are not recognized as cognates because the Dutch equivalents have one extra letter (double vowel). If the foreign word is longer, as in "Stadt"

(town, Dutch: stad) or "nahm" (took, Dutch: nam), for instance, there is no problem and this also is the case where words with the same length even if they have a different spelling pattern like "Ruhm" (fame, Dutch: roem) are concerned. The German word "Art" (manner, way, Dutch: aard), which like "Tat" and "stets" has more or less the same pronunciation as in Dutch is at the first encounter usually confused with the English and French word with the same spelling. There are strong indications that this happens on the automatic level, as the students are not conscious of what happens. Concrete words like "rot" (red, Dutch: rood) or "Tür" (door, Dutch: deur) are easier, probably because the context helps.

The phenomenon of potential vocabulary also suggests that morphemes play a role in lexical access. Emmorey found a large priming effect for morphologically related words that are not semantically related, but no priming on the basis of suffixes (1989). Data about the organisation of the lexicon seem to suggest a storing of the stem morpheme as the center with connectable morphemes as satellites (Taft 1988, this kind of organisation is also suggested for declined forms, Lukatela et al. 1987). I found an indication for such an organisation in an aspect of word acquisition. Sometimes words, mainly verbs, with the same or approximately the same meaning in Dutch and German have a cognate stem, but different prefixes. Such verbs like "unterlassen" or "unterbleiben" are often lack of contrast words (see hereunder) as well. At first I explained the meaning of these words in German by giving the equivalents of "fail to do" or "not to happen". This made these verbs very difficult to retain, probably partly due to the use of negatives. Then I tried the Dutch cognates "nalaten" and "uitblijven", which made them easy to retain. Apparently, now the students could store them easily. There are indications that word stems and affixes are processed differently (Cutler et al. 1985).

Another phenomenon that I observed is that word ends get less attention or are skipped even when reading even on the conscious level. It is a typical characteristic of weak readers in the L1 to do this - at least in English - because they are too slow in automatic decoding to use all the graphic information (Potter 1980). Foreign language readers tend to be weak readers as well, so the phenomenon is not surprising. Wrong translations are generally based on word beginnings even if these beginnings are prefixes. Word stems play a role too, word endings, however, are rarely used for the search for meaning. Inflectional indicators that in German - like in most languages (Segui/ Zubizaretta 1985) - occur at the end of words are rarely paid attention to, as they hardly exist in Dutch, but indicators or endings looking like Dutch plural endings (-en/ -s) do get some attention. Word onsets have been found to be psychologically more salient (Cutler et al. 1985).

One of the first phenomena that struck me is what I have called, using a term from Juhász (1970), lack of contrast. The phenomenon of lack of contrast means that similarity can be an interfering factor when some strongly acquired knowledge impedes the acquistion of similar new knowledge. Like Juhász, who taught German to Hungarians, I found this to be an intralingual phenomenon, e.g. in the case of the "Er-" nouns (Ergebnis -result-, Ereignis -event- etc.) or in words like "Wirtschaft" (economy) and "Wissenschaft" (science) etc. But the most important type of lack of contrast I found was one consisting of a mixture of inter- and intralingual lack of contrast in the case of words like "entsprechen" (suit, correspond to/with), "Vorgang" (process,facts), "Vorgehen" (action, procedure), "Verfahren" (procedure, method), "Beleg" (proof, evidence) and to a lesser extent auch "Bedingung" (condition), where both stem and affixes are familiar, but give no clue as to the meaning. Special cases

here are words like "Gegenstand" (object, subject) and "Verhalten" (behaviour), that are also false friends. Here the meaning suggested by the L1 is so strong that it takes the reader a long time to acquire access the right meaning without a conscious analysis. However, the meaning of "entsprechen" , a very frequent word in scientific texts, is still more difficult to acquire, both on the automatic and on the conscious level, than that of "Gegenstand". My findings indicate that mere reading of these words occurs without processing on the semantic level. Furthermore readers do not realize that they do not understand these words. So there must be some kind of access, only not on the semantic level. On the word level in as far as the external form is concerned, words are experienced as being known, probably because the stem and affixes are indeed familiar. Words like "Dauer" (duration, period) or "Sparte" (field, subject,branch) on the contrary are nearly always looked up in a dictionary, apparently because they look less familiar. As soon as one morpheme is unknown, like in "Verteufelung" (demonisation) or "Einstieg" (entrance, getting in) many students look up the words during the exam (this can be checked, because they underline them in the text) or ask for their meaning in class. It would seem that the automatic decoding process is interrupted when they come accross such words. Slower processing which is to be expected when they come accross unfamiliar word shapes probably arouses attentional processes. This is clearly not the case when the form of an unknown word looks familiar, certainly not on the first reading. I also found that words with lack of contrast for abstract concepts are more difficult to acquire than similar words for concrete concepts. "Gewerkschaft" (union) or "Verfassung" (constitution) e.g. are easier than "Grundsatz" (principle).

I hoped to find an explanation for the lack of contrast phenomenon, which apparently is one of the main problems for

Dutch readers of this kind of rather difficult scientific texts in the literature on the mental lexicon.

The mental lexicon can be defined either as a store of the linguistic knowledge of the language user or as a linguistic processor. The term "mental lexicon" is a metaphor used to name the construct of some kind of structure containing or consisting of form oriented verbal knowlegde. It is a very vague concept as we know so little about it. In reference to memory terms like "structure", "system" and "store" are often used. These have the disadvantage of their static connotation. Memory, however, is dynamic and is nowadays seen as a whole number of processes, or as "a large number of simple processing elements which send excitatory and inhibitory signals to each other via modifiable connections" (McClelland/ Rumelhart 1985). Unfortunately, it is difficult to talk about memory without using concepts with a static connotation. Therefore, these concepts have to be considered as dynamic in this context.

In cognitive psychology the mental lexicon is generally considered an integral part of semantic memory. The possibility however of a distinction between semantic memory and the mental lexicon has occasionally been suggested (Tulving et al. 1982, Bierwisch 1979, Forster 1985, Baddeley 1978). But although there is a clear tendency in recent research to distinguish more and more different structures and/ or kinds of processes in memory a distinction between semantic memory and mental lexicon is rarely considered in experiments on lexical access. What kind or product of information or what level of processing is accessed is not considered in many of the data from cognitive psychology (Gerrig 1986, cf. Mitchell 1983). Often word representation is seen as a kind of semantic network. But does "lexical access" mean a recognition of form or does it also imply semantic processing? Inhoff discusses his data in the light of a two-process-model,

that distinguishes between lexical and post-lexical processes or between lexical access and word interpretation. He found that lexical access happens automatically, whereas post-lexical interpretation requires effort (1984). This would confirm the view that decoding linguistic forms is an automatic process when not interrupted by unknown elements, misinterpretations or other disturbances and that semantic processing is a process requiring attention.

As soon as the representation form in memory of more than one language is discussed the question arises of a common semantic store with either different word forms with some kind of language tagging within the semantic network or a separate store for the different linguistic systems. Even completely different systems on the semantic level can be considered. In the literature Kirsner et al. found 5 different models of lexical organisation in bilinguals:
- no link between the storage locations of words belonging to different languages
- links connecting only translation equivalents
- a single location shared by both bilingual representations of a word
- a direct connection between as well as within languages for associated words
- connections via an underlying language free conceptual system.
According to their data the last two models are possible (1984).

Most research seems to imply some kind of common semantic or conceptual store and different lexical systems (e.g. Frenck/ Pynte 1987, but although they found evidence for across-language activation, they prefer to be cautious before coming down in favour of a unique semantic system). Kolers, however, does not accept this. He found very different associations for translation equivalents. According to me this could be explained in the light

of episodic memory, but Kolers does not accept Tulvings distinction between episodic and semantic memory either (Kolers/ Gonzalez 1980). In the conception of a common semantic store word forms in the different languages are mostly seen as satellites around the concept. A problem with this conception is the repeated finding that synonyms and translation equivalents do not have the same kind of influence on processing (Lutjeharms 1988, p.148 for bibliographical data). Priming has been found to work both intra- and interlingually. For interlingual priming to occur some form of semantic processing is necessary (ibid. p.149). It is questionable however, whether this must always be the case. The type of language acquisition and the way the languages are used could influence the type of priming. For interpreters and translators for instance, it could be different in the case of translation equivalents they frequently access and connect, but then on the word or collocation level only, where semantic processing must not always occur. Observations of the translation process indicate the existence of a deverbalisation phase (Seleskovitch 1984), which implies a connection via the common semantic store.

The distinction between semantic memory and mental lexicon as separate structures or processes is useful in explaining the data of experiments with bilinguals. Semantic memory can then be considered as the common semantic store, whereas the mental lexicon can be explained as a language specific structure. Acquisition of another language probably starts with the help of the existing lexicon before developing into a new separate system or subsystem (cf. the data of Gekoski et al. 1982). Connections between the systems can be more or less strong. That such connections exist is shown by transfer phenomena.

A distinction between semantic memory and mental lexicon seems necessary to explain the lack of contrast phenomenon I found.

Recognition of form could then be seen as a process on the level of the lexicon without connecting this form to semantic memory. Access to meaning must then be seen as a different process. There are some other observations that could be explained by such a distinction. It might explain why words with a similar sound or visual pattern but belonging to completely different semantic networks can be confused, the so called malapropisms. Napps/ Fowler also suggest a formal dimension of organisation of language in memory because of such word-substitution errors and because of the tip-of-the-tongue phenomenon (1987). A conception of the organisation of the mental lexicon as based on phonological and/or morphological principles could account for such phenomena. In addition to this lexical access occurring without processing on the semantic level is found even in the L1, but then due to lack of attention. We can sometimes hear or read a known language without paying attention to the meaning. However some forms (e.g. a name) can focus attention on the meaning. This means that some kind of processing has been going on.

In the L2 or with texts that are too difficult in the L1 the failure to decode on the semantic level can be the consequence of an overloading of working memory capacity, because all attention is normally needed for automatical decoding of linguistic forms and only recognition of forms is attempted or can be reached. The level of processing can depend on the task (Frenck/ Pynte 1987). When reading aloud this phenomenon typically occurs, because the oral production uses much of the capacity of the working memory. However words are pronounced correctly and reading errors indicate that there are expectations based on word order, and more important in this context, based on the syntactic realisation of one of the levels of semantic valency, i.e. on the relations between and the number of arguments that can or must be used with certain words. Syntactic knowledge, which is difficult to see as part of the conceptual networks of semantic memory

could be said to belong to the level of the mental lexicon. Hanley, who discusses syntactic analysis, makes a distinction between syntactic and propositional representation, which is parallel to the one discussed here (1987). Finally, the conception of a dichotomy in language specific and general cognitive ability for realising abstract mental processes as developped by Felix (1982) complies with the distinction between mental lexicon and semantic memory.

When the connection between a target language word and semantic memory is not strong enough or non-existant, the native or even a second language will interfere as soon as the word form allows this, as in "Gegenstand" (Dutch "tegenstand" means "resistance, opposition"), in "weil" (interference from both Dutch -terwijl- and English -while-) or in "Art". I found that even when the right meaning can be accessed after a conscious search, the stronger connection between the form of the target language word and the meaning of this form in another linguistic code is first activated. This kind of activation will diminish and maybe even disappear in some cases, in the course of the language acquisition process. Yet there are a number of words in Dutch and German, that have exactly the same written form, but that are hardly ever confused, like "malen" (German: paint, Dutch: grind/mill) or "Leute" (German: people, Dutch: fun). This might be due to the fact that the Dutch meaning of these words is very improbable in the kind of texts tha students have to read. However, this interpretation implies interaction between the lexical and the semantic level (cf. Balota et al. 1985)

Forster distinguishes still more levels. "He argues that the language processor comprises three relatively independent, hierarchically arranged subsystems. At the lowest level, the lexical subsystem accesses the representations of (read or heard) words in the lexicon. This information is then passed along to

the message subsystem which assigns grammatical roles to the sequence of words. This information is then passed along to the arrangement of words. A general problem solver (GPS) integrates information from all three levels." (Urošević et al. 1988, p. 58, cf. Forster 1985). This he considers to be an automatic process in normal language comprehension. These three processes probably all occur on the level of the lexicon as semantic processing is an attentional process. The word level and the syntactic level are intertwined in word valency. Of course word valency can influence decoding only after this particular word has been accessed on some level, but this level can be the mental lexicon as syntactic valency is language specific.

Schriefers et al. studying language production consider a two-stage model of lexical access with a first stage where only meaning is activated, followed by a stage where only the form of the word is activated (1990). With form they mean the phonological characteristics. the fact that they studied language production explains the contrast in the serial order of levels.

The distinction between mental lexicon and semantic memory as different structures or processes is a useful explanation for a number of findings, but it also brings up the problem of the kind of interaction and the connections between them. Little can be said about this problem but perhaps the concept of word valency with its syntactic and two semantic levels (the relations between word meaning and its arguments and the semantic compatibility between words) could play a role in explaining the interaction. Data from experiments on priming give hardly any indications of the interaction between the mental lexicon and semantic processing because the two levels of access tend to be confused in these experiments. The usual closing remark that much more research on this subject is needed is appropriate here.

Bibliography

- Baddeley, A.D. (1978), The Trouble with Levels: A Reexamination of Craik and Lockhart's Framework for Memory Research, in: Psychological Review 85, 139-152.
- Bierwisch, M. (1979), Strukturen und Prozesse im Sprachverhalten, Einleitende Prozesse, in: Bierwisch, M. (ed), Psychologische Effekte sprachlicher Strukturkomponenten, Akademie-Verlag, Berlin.
- Cutler, A., Hawkins, J.A. and G. Gilligan (1985), The suffixing preference: a processing explanation, in: Linguistics 23, 723-758.
- Emmorey, K.D. (1989), Auditory Morphological Priming in the Lexicon, in: Language and Cognitive Processes 4, 73-92.
- Felix, S.W. (1982), Psycholinguistische Aspekte des Zweitsprachenerwerbs, Gunter Narr Verlag, Tübingen.
- Forster, K.I. (1985), Lexical acquisition and the modular lexicon, in: Language and Cognitive Processes 1, 87-108.
- Frenck, C. and J. Pynte (1987), Semantic Representation and Surface Forms: A Look at Across-Language Priming in Bilinguals, in: Journal of Psycholinguistic Research 16, 383-396.
- Gekoski, W.L., Jacobson, J.Z. and A.P. Frazao-Brown (1982), Visual Masking and Linguistic Independence in Bilinguals, in: Canadian Journal of Psychology 36, 108-116.
- Gerrig, R.J. (1986), Process and products of lexical access, in: Language and Cognitive Processes 1, 187-195.
- Hanley, J.R. (1987), Semantic Heuristics, Syntactic Analysis, and Case-Role Assignment, in: Journal of Psycholinguistic Research 16, 329-334.
- Hudson, P.T.W. (1981), Psycholinguistic Approaches to the Mental Lexicon, in: ANéLA (ed), Woorden in het vreemde-talenonderwijs, Toegepaste taalwetenschap in artikelen 11, VU boekhandel/ uitgeverij, Amsterdam.

- Inhoff, A.W. (1984), Two Stages of Word Processing during Eye Fixations in the Reading of Prose, in: Journal of Verbal Learning and Verbal Behavior 23, 612-624.
- Juhász, J. (1970), Probleme der Interferenz, Akademiai Kiado, Budapest (also: Hueber, München).
- Kirsner, K., Smith, M.C., Lockhart, R.S. and M.L. King (1984), The Bilingual Lexicon: Language-Specific Units in an Integrated Network, in: Journal of Verbal Learning and Verbal Behavior 23, 519-539.
- Kolers, P.A. and E. Gonzalez (1980), Memory for Words, Synonyms and Translations, in: Journal of Experimental Psychology: Human Learning and Memory 6, 53-65.
- Lukatela, G., Carello, C. and M.T. Turvey (1987), Lexical representation of regular and irregular inflected nouns, in: Language and Cognitive Processes 2, 1-17.
- Lutjeharms, M. (1988), Lesen in der Fremdsprache. Versuch einer psycholinguistischen Analyse am Beispiel Deutsch als Fremdsprache. AKS-Verlag, Bochum.
- McClelland, J.L. and D.E. Rumelhart (1985), Distributed Memory and the Representation of General and Specific Information, in: Journal of Exprimental Psychology: General 114, 159-188.
- Mitchell, D.C. (1983), The Process of Reading. A Cognitive Analysis of Fluent Reading and Learning to Read, John Wiley & Sons, Chichester etc.
- Napps, S.E. and C.A. Fowler (1987), Formal Relationships Among Words and the Organization of the Mental Lexicon, in: Journal of Psycholinguistic Research 16, 257-272.
- Potter, F. (1980), Miscue Analysis: a cautionary note, in: Journal of Research in Reading 3, 116-128.
- Segui, J. and M.-L. Zubizaretta (1985), Mental representation of morphologically complex words and lexical access, in: Linguistics 23, 759-774.
- Séleskovitch, D. (1984), De la possibilité de traduire, in: Nivette, J., Goyvaerts, D. and P. Van De Craen (eds) (1984), AILA

Brussels 84, proceedings, vol. 5: plenary papers, 1781-1795.
- Schriefers, H., Meyer, A.S. and W.J.M. Levelt (1990), Exploring the Time Course of Lexical Access in Language Production: Picture-Word Inference Studies, in: Journal of Memory and Language 28, 86-102.
- Smith, P.T. and C.M. Sterling (1982), Factors Affecting the Perceived Morphemic Structure of Written Words, in: Journal of Verbal Learning and Verbal Behavior 21, 704-721.
- Taft, M. (1988), A morphological-decomposition model of lexical representation, in: Linguistics 26, 657-667.
- Tulving, E., Schacter, D.L. and H.A. Stark (1982), Priming Effects in Word-Fragment Completion Are Independent of Recognition Memory, in: Journal of Experimental Psychology: Learning, Memory, and Cognition 8, 336-342.
- Urošević, C., Carello, M., Savić, M., Lukatela, G. and M.T. Turvey (1988), Word Order and Inflectional Strategies in Syntactic Processing, in: Language and Cognitive Processes 3, 49-71.